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Agdex 113/33-13
August, 1988

Varietal Description of Robert Spring Oat

Origin and Breeding

Robert oat, tested as OT238, W81274 and W82056, was developed at the Agriculture Canada, Winnipeg Research Station from the cross OT212/RL3064. OT212 was derived from the cross OT187*2/Kent. OT187 was derived from a four way cross involving CI6792, Rodney, OT174, RL2877, Pendek and Lodi. RL3064 is the result of a complex series of crosses involving Kent, Pendek, Rodney, Kelsey, Harmon, Rosens Mutant, CI6792, and a sister line of Hudson, as well as the *Avena sterilis* accessions CAV2647, CAV2648 and CAV5165.

The last cross in the development of Robert was made in 1977. The F_2 plants were screened for the reaction to oat stem rust and oat crown rust and the seed was harvested as bulk. A subsample of the resulting seed was planted in the 1978-79 New Zealand nursery where individual heads were selected based on kernel appearance, agronomic merit and Barley yellow Dwarf Virus (BYDV) and crown rust resistance. In the F_4, head rows were grown and head selections were made based on stem rust, crown rust and smut reactions, agronomic and kernel appearance. The F_5 generation was grown in the 1979-80 New Zealand nursery where individual heads were again selected using the same selection criteria as in the F_3 generation. The F_6 generation head rows were grown in 1980 in Glenlea; individual head rows were selected and bulked based on the same criteria used in the F_4 generation as well as plot yield, test weight and BYDV rating. In 1985, approximately two hundred F_{11} head rows were harvested for use as breeder seed for Robert.

Varietal Characteristics

Plant Characteristics:

Coleoptile: green
Juvenile growth habit: erect
Flag leaf: medium green; semi-erect, medium width and length; flag leaf internode is medium to dark green with slight waxy bloom; ligule present at the base of the leaf blade
Leaves: medium green; few hairs on leaf sheath and blade; glabrous leaf margins; slight waxy bloom
Culm: a few hairs above and below uppermost node; whitish yellow; medium thickness
Plant height: medium; slightly shorter than Dumont
Heading: mid-season
Maturity: mid-season; slightly earlier than Dumont
Shattering resistance: fair to good
Sprouting tendency: high
Daylight reaction: sensitive
Lodging resistance: very good
Disease reaction: resistant to stem rust (*Puccinia graminis avenae*), crown rust (*Puccinia coronata*) and covered smut (*Ustilago kolleri*); moderately resistant to red leaf virus (BYDV)

Panicle Characteristics:

Shape: equilateral; intermediate length and width; intermediate density
Attitude: slight nodding
Color: grass green with slight waxy bloom at heading; white to yellow at maturity
Side branches: semi-erect; variable lengths; 5-6 whorls
First node: glabrous
Rachis: straight; nodding
Rachilla: straight; medium length and width; few short or no hairs

Spikelet Characteristics:

Attidute: nodding to drooping
Florets: two or less per spikelet

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Glumes: medium length and width; 10-12 veins; medium texture; slight waxy bloom, buff at maturity
Lemma: medium to short; medium pointed tip, surface red and buff coloration
Lemma awns: few; weak non-twisted; white to yellow
Kernel separation: primary kernel separation by fracture; rachilla retained on primary kernel

Seed Characteristics:
Color: buff
Size: wide; medium long
Caryopsis: pubescent
Quality: high protein; intermediate oil content

Performance and Adaptation

Robert is moderately resistant to barley yellow dwarf virus and has very good resistance to lodging. It is earlier in maturity than Dumont (table 2). This variety also has a lower percent hull and higher protein than Dumont; Robert has a lower test weight than Dumont. Robert is best adapted to Manitoba where it has similar groat yield to Dumont .

Maintenance of Breeder Seed: Indian Head Experimental Farm

Canadian Distributor: SeCan Association

Recommended by: Expert Committees on Grain Breeding and Diseases

Table 1: Yield Performance (00's kg/ha) of Robert and Check Varieties, Western Oat Test, 1984-1986*

Year	Variety	Zone 1	Zone 2	Zone 3	Mean Grain	Mean Groats
1984	Robert	40.7	46.6	21.2	36.2	27.6
	Rodney	38.7	40.7	20.0	33.0	24.8
	Dumont	43.2	50.8	22.7	37.6	28.3
	Calibre	43.2	52.9	23.5	38.7	29.0
	Cascade	41.2	51.3	22.5	37.2	26.3
1985	Robert	41.3	25.6	25.0	34.6	27.1
	Rodney	37.8	25.7	25.6	32.0	24.5
	Dumont	43.9	29.9	28.1	36.3	28.1
	Calibre	42.5	31.2	31.0	37.2	29.1
	Cascade	39.5	34.1	32.0	36.4	27.4
1986	Robert	45.5	48.5	41.9	43.9	34.3
	Rodney	35.0	44.1	44.0	38.9	29.4
	Dumont	43.9	48.9	47.7	45.1	34.5
	Calibre	39.0	58.9	48.7	45.5	35.1
	Cascade	35.6	59.4	45.8	43.0	31.3
		(21)**	(8)	(14)	(48)	
Mean	Robert	42.5	39.4	29.7	38.2	29.7
1984-	Rodney	37.2	36.4	30.2	34.6	26.3
1986	Dumont	43.7	42.3	33.2	39.7	30.3
	Calibre	41.6	47.0	34.6	40.5	31.1
	Cascade	38.8	47.9	33.5	38.9	28.9

* Test locations:
Zone 1: Black soil zone of Manitoba and Saskatchewan: Glenlea, Morden, Portage la Prairie, Brandon, Indian Head, Melfort
Zone 2: Black and grey soil zone of Alberta: Lacombe, Beaverldoge, Fort Vermilion
Zone 3: Brown soil zone of Saskatchewan and Alberta: Regina, Saskatoon, Swift Current, Scott, Acme

** number in parenthesis = number of test locations

Table 2: Agronomic Performance of Robert and Check Varieties, Western Co-operative Oat Test, 1984-1986

Variety	Lodging (1-9)*	Maturity (days)	Height (cm)	Test weight (kg/hl)	1000 kernel weight (g)	Plump (%)	Hull (%)	Oil (%)	Protein (%)
	(19)[1]	(35)	(42)	(46)	(23)	(3)	(13)		
Robert	1.7	97.1	92	49.1	39.2	80.1	22.7	4.6	12.3
Rodney	4.0	96.2	102	50.8	31.2	59.6	24.3	5.2	12.2
Dumont	3.3	99.7	95	50.1	34.6	64.1	23.7	4.9	11.4
Calibre	3.5	98.3	98	51.0	35.1	42.6	23.6	4.8	12.0
Cascade	2.7	96.0	100	47.4	32.9	42.0	27.4	4.3	11.2

* 1-9; 1 = no lodging

[1] Number in parenthesis = number of locations

Table 3: Disease reactions of Robert and Check Varieties, Western Co-operative Test, 1984-1986

	Field Data [1]					
	Oat Stem Rust			Oat Crown Rust		
Variety	1986	1985	1984	1986	1985	1984
Robert	R	20MR	30RMR	0VR	0VR	0VR
Rodney	40S	80S	80S	80S	80S	50S
Dumont	R	20RMR	10RMR	0VR	0VR	0VR
Calibre	30S	80S	80S	80S	80S	60S
Cascade	20MSS	80S	80S	80S	80S	70S
Fidler		20MR	20MR		30MR5MS	30MR5MS
Riel		20RMR	30MR		0VR	0VR

	Smut Data [2] (%)			Barley Yellow Dwarf Virus (1-9)[3]								
				1986			1985		1984			
				Glenlea		Ste-Foy	Glenlea		Glenlea			Ste-Foy
Variety	1986	1985	1984	Aug 5	Sep 2		Jun 30	Jul 26	Jul 20	Aug 9	Aug 24	
Robert	0	0	0	3.6	3.5	3.9	5.1	3.6	4.1	3.5	3.7	7.2
Rodney	0	4	21	7.3	7.1	8.3	5.7	5.1	4.7	5.8	3.9	7.9
Dumont	0	0	0	5.6	5.0	6.1	4.5	3.5	5.7	3.8	3.2	7.4
Calibre	15	12	22	5.8	6.2	7.7	5.5	5.0	6.3	6.1	5.7	7.9
Cascade	5	4	31	4.8	4.9	6.3	5.4	4.1	4.6	4.9	1.9	7.7
Fidler	-	0	0	-	-	-	5.4	4.1	4.6	4.6	3.7	7.4
Riel	-	0	0	-	-	-	6.2	5.2	6.8	7.5	6.4	8.0

[1] Field readings based on reaction to a mixture of virulent races, artificially inoculated. Disease ratings: S = susceptible, MS = moderately susceptible, MR = moderately resistant, R = resistant, VR = very resistant

[2] expressed as a percent of infected plants

[3] 1-9; 1 = very resistant, 9 = very susceptible

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